

# ESSENTIAL FISH HABITAT EIS

## TABLE OF CONTENTS

### EXECUTIVE SUMMARY

<b>CHAPTER 1</b>	<b>PURPOSE AND NEED FOR ACTION</b>	<b>1-1</b>
1.1	Introduction	1-1
1.2	Purpose and Need for Action	1-2
1.2.1	Purpose of Action	1-2
1.2.2	Need for Action	1-2
1.3	NEPA Analysis and Fishery Management Plan Actions	1-3
1.4	Notice of Intent and Scoping Process	1-4
1.5	Project Area	1-5
1.5.1	Bering Sea/Aleutian Islands Groundfish	1-6
1.5.2	Gulf of Alaska Groundfish	1-6
1.5.3	Bering Sea/Aleutian Islands King and Tanner Crab	1-6
1.5.4	Alaska Scallops	1-7
1.5.5	Salmon Fisheries in the EEZ off the Coast of Alaska	1-7
1.6	Decisions and Proposed Schedule	1-7
1.7	Organization of the EIS	1-8
<b>CHAPTER 2</b>	<b>ALTERNATIVES INCLUDING THE PROPOSED ACTION</b>	<b>2-1</b>
2.1	NEPA Guidance for Alternatives	2-1
2.2	Background and Alternative Formulation	2-1
2.2.1	History of Habitat Policy	2-1
2.2.2	Overview of Previous Actions to Protect Fish Habitat	2-2
2.2.2.1	Fishing Equipment Restrictions	2-3
2.2.2.2	Marine Protected Areas and Marine Managed Areas	2-4
2.2.2.3	Harvest Limits	2-6
2.2.2.4	Effort Reduction and Limitation	2-6
2.2.2.5	Fishery Rationalization Programs	2-7
2.2.2.6	Other Fishery Regulations that Protect Fish Habitat	2-8
2.2.2.7	Original EFH FMP Amendments 55/55/8/5/5	2-8
2.2.2.8	Additional HAPC Amendments Considered by the Council	2-9
2.2.3	Development of Alternatives for this Analysis	2-11
2.3	Description of the Alternatives	2-14
2.3.1	EFH Description Alternatives	2-14
2.3.1.1	Alternative 1: No EFH Description (No Action)	2-17
2.3.1.2	Alternative 2: Status Quo – Existing EFH General Distribution	2-17
2.3.1.2.1	GOA Groundfish FMP	2-18
2.3.1.2.2	BSAI Groundfish FMP	2-19
2.3.1.2.3	BSAI King and Tanner Crab FMP	2-20
2.3.1.2.4	Alaska Scallop FMP	2-21
2.3.1.2.5	Alaska Salmon FMP	2-21
2.3.1.3	Alternative 3: Revised General Distribution	2-22
2.3.1.3.1	GOA Groundfish FMP	2-23
2.3.1.3.2	BSAI Groundfish FMP	2-24
2.3.1.3.3	BSAI King and Tanner Crab FMP	2-24
2.3.1.3.4	Alaska Scallop FMP	2-25
2.3.1.3.5	Alaska Salmon FMP	2-25
2.3.1.4	Alternative 4: Presumed Known Concentrations	2-26

2.3.1.4.1	GOA Groundfish FMP	2-28
2.3.1.4.2	BSAI Groundfish FMP	2-29
2.3.1.4.3	BSAI King and Tanner Crab FMP	2-30
2.3.1.4.4	Alaska Scallop FMP	2-30
2.3.1.4.5	Alaska Salmon FMP	2-31
2.3.1.5	Alternative 5 Eco-region Strategy	2-32
2.3.1.6	Alternative 6: EEZ Only	2-41
2.3.1.6.1	GOA Groundfish FMP	2-41
2.3.1.6.2	BSAI Groundfish FMP	2-42
2.3.1.6.3	BSAI King and Tanner Crab FMP	2-43
2.3.1.6.4	Alaska Scallop FMP	2-43
2.3.1.6.5	Alaska Salmon FMP	2-44
2.3.2	HAPC Identification Alternatives	2-44
2.3.2.1	Alternative 1: No HAPC Identification	2-45
2.3.2.2	Alternative 2: Status Quo (No Action)	2-45
2.3.2.3	Alternative 3: Site Based Concept	2-45
2.3.2.4	Alternative 4: Type/Site Based Concept	2-46
2.3.2.5	Alternative 5: Species Core Area	2-47
2.3.3	Alternatives to Minimize the Effects of Fishing on EFH	2-47
2.3.3.1	Alternative 1: Status Quo (No Action)	2-51
2.3.3.2	Alternative 2: Gulf Slope Bottom Trawl Closures	2-51
2.3.3.3	Alternative 3: Upper Slope Bottom Trawl Prohibition for GOA Slope Rockfish	2-52
2.3.3.4	Alternative 4: Bottom Trawl Closures in All Management Areas	2-52
2.3.3.5	Alternative 5A: Expanded Bottom Trawl Closures in All Management Areas	2-54
2.3.3.6	Alternative 5B: Expanded Bottom Trawl Closures in All Management Areas with Sponge and Coral Area Closures in the AI	2-55
2.3.3.7	Alternative 6: Closures to All Bottom Tending Gear in 20 Percent of Fishable Waters	2-57
2.4	Preliminary Preferred Alternatives	2-58
2.4.1	Preliminary Preferred Alternative for EFH Description	2-58
2.4.2	Preliminary Preferred Alternative for HAPC Identification	2-59
2.4.3	Preliminary Preferred Alternative for Minimizing the Effects of Fishing on EFH	2-59
2.5	Alternatives Considered and Eliminated from Detailed Study	2-59
2.5.1	EFH Description Alternatives Eliminated	2-60
2.5.2	HAPC Identification Alternatives Eliminated	2-60
2.5.3	EFH Fishing Impact Minimization Alternatives Eliminated	2-61
<b>CHAPTER 3 AFFECTED ENVIRONMENT</b>		<b>3-1</b>
3.1	Physical Environment and Habitat Features	3-1
3.1.1	Gulf of Alaska	3-2
3.1.2	Bering Sea	3-3
3.1.3	Aleutian Islands	3-5
3.1.4	Streams that Support Federally Managed Salmon	3-5
3.2	Biological Environment	3-6
3.2.1	Biology, Habitat Usage, and Status of Magnuson-Stevens Act Managed Species	3-6
3.2.1.1	GOA Groundfish	3-6
3.2.1.1.1	Walleye Pollock	3-6
3.2.1.1.2	Pacific Cod	3-8
3.2.1.1.3	Yellowfin Sole	3-9
3.2.1.1.4	Greenland Halibut	3-9
3.2.1.1.5	Arrowtooth Flounder	3-10

3.2.1.1.6	Rock Sole	3-10
3.2.1.1.7	Flathead Sole	3-10
3.2.1.1.8	Other Flatfish	3-11
3.2.1.1.9	Sablefish	3-11
3.2.1.1.10	Rockfish	3-12
3.2.1.1.10.1	Pacific Ocean Perch	3-13
3.2.1.1.10.2	Shortraker and Rougheye Rockfish	3-14
3.2.1.1.10.3	Northern Rockfish	3-15
3.2.1.1.10.4	Other Slope Rockfish Species	3-15
3.2.1.1.10.5	Pelagic Shelf Rockfish	3-15
3.2.1.1.10.6	Demersal Shelf Rockfish	3-16
3.2.1.1.10.7	Thornyheads	3-17
3.2.1.1.11	Atka Mackerel	3-17
3.2.1.2	BSAI Groundfish	3-18
3.2.1.2.1	Walleye Pollock	3-18
3.2.1.2.2	Pacific Cod	3-19
3.2.1.2.3	Yellowfin Sole	3-19
3.2.1.2.4	Greenland Halibut	3-20
3.2.1.2.5	Arrowtooth Flounder	3-21
3.2.1.2.6	Rock Sole	3-21
3.2.1.2.7	Flathead Sole	3-22
3.2.1.2.8	Other Flatfish	3-22
3.2.1.2.9	Sablefish	3-23
3.2.1.2.10	Rockfish	3-23
3.2.1.2.10.1	Pacific Ocean Perch	3-23
3.2.1.2.10.2	Shortraker and Rougheye Rockfish	3-23
3.2.1.2.10.3	Northern Rockfish	3-23
3.2.1.2.10.4	Other Rockfish Species	3-24
3.2.1.2.11	Atka Mackerel	3-24
3.1.2.3	BSAI King and Tanner Crabs	3-25
3.2.1.3.1	Red King Crabs	3-26
3.2.1.3.2	Blue King Crabs	3-27
3.2.1.3.3	Golden King Crabs	3-28
3.2.1.3.4	Scarlet King Crabs	3-29
3.2.1.3.5	Tanner Crabs	3-29
3.2.1.3.6	Opilio Tanner Crabs	3-30
3.2.1.3.7	Grooved Tanner Crabs	3-30
3.2.1.3.8	Triangle Tanner Crabs	3-31
3.1.2.4	Scallops	3-31
3.1.2.5	Salmon	3-32
3.2.1.5.1	Pink Salmon	3-33
3.2.1.5.2	Chum Salmon	3-34
3.2.1.5.3	Sockeye Salmon	3-36
3.2.1.5.4	Coho Salmon	3-37
3.2.1.5.5	Chinook Salmon	3-38
3.2.2	Biology, Status, and Habitat Usage of Species Managed Under Other Authorities	3-41
3.2.2.1	Steelhead Trout	3-41
3.2.2.2	Pacific Halibut	3-41
3.2.2.3	State-Managed Groundfish	3-43
3.2.2.3.1	Pacific Cod	3-43
3.2.2.3.2	Walleye Pollock	3-43
3.2.2.3.3	Sablefish	3-43

3.2.2.3.4	Lingcod	3-43
3.2.2.3.5	Rockfish	3-43
3.2.2.4	State-Managed Crabs	3-44
3.2.2.4.1	BSAI Korean Hair Crab	3-44
3.2.2.4.2	GOA King and Tanner Crabs	3-44
3.2.2.5	Herring	3-45
3.2.3	Protected Species	3-46
3.2.3.1	Steller Sea Lion	3-47
3.2.3.2	ESA-listed Whales	3-50
3.2.3.2.1	Northern Right Whale	3-50
3.2.3.2.2	Blue Whale	3-51
3.2.3.2.3	Fin Whale	3-51
3.2.3.2.4	Sei Whale	3-52
3.2.3.2.5	Humpback Whale	3-52
3.2.3.2.6	Sperm Whale	3-52
3.2.3.2.7	Bowhead Whale	3-52
3.2.3.3	Other Marine Mammals	3-53
3.2.3.4	Endangered and Threatened Pacific Salmon and Steelhead	3-54
3.2.3.5	Endangered Seabirds	3-56
3.2.3.6	Other Seabirds	3-57
3.2.4	Other Biological Resources	3-59
3.2.4.1	Corals, Sponges, Bryozoans, and Other Sessile Benthic Invertebrates	3-59
3.2.4.1.1	Corals	3-59
3.2.4.1.2	Sponges	3-61
3.2.4.1.3	Bryozoans	3-61
3.2.4.1.4	Other Sessile Epifauna	3-62
3.2.4.2	Forage Fish	3-64
3.2.4.2.1	Capelin	3-65
3.2.4.2.2	Eulachon	3-66
3.2.4.2.3	Pacific Sand Lance	3-66
3.2.4.2.4	Significance of Forage Fish in the Diet of Eastern Bering Sea Groundfish	3-67
3.2.4.2.5	Significance of Forage Fish in the Diet of Gulf of Alaska Groundfish	3-68
3.2.4.2.6	Significance of Forage Fish in the Diet of Aleutian Islands Groundfish	3-68
3.2.4.3	Squid and “Other Species”	3-69
3.2.4.3.1	Squid	3-69
3.2.4.3.2	Sculpins	3-70
3.2.4.3.3	Skates	3-70
3.2.4.3.4	Sharks	3-71
3.2.4.3.5	Octopi	3-71
3.3	Ecosystem Considerations	3-71
3.3.1	Bering Sea and Aleutian Islands Ecosystem	3-74
3.3.2	Gulf of Alaska Ecosystems	3-75
3.4	Human Activities	3-76
3.4.1	Magnuson-Stevens Act Managed Fisheries	3-76
3.4.1.1	GOA Groundfish Fisheries	3-76
3.4.1.1.1	Summary of the GOA Groundfish FMP	3-76
3.4.1.1.2	Description of the Fisheries and Gears	3-79
3.4.1.1.2.1	GOA Pollock Trawl Fishery	3-79
3.4.1.1.2.2	GOA Pacific Cod Trawl Fishery	3-81
3.4.1.1.2.3	GOA Deepwater Flatfish Trawl Fishery	3-82

	3.4.1.1.2.4	GOA Shallow Water Flatfish Trawl Fishery	3-83
	3.4.1.1.2.5	GOA Slope Rockfish Trawl Fishery	3-84
	3.4.1.1.2.6	GOA Sablefish Longline Fishery	3-86
	3.4.1.1.2.7	GOA Southeast Demersal Shelf Rockfish Longline Fishery	3-87
	3.4.1.1.2.8	GOA Pacific Cod Longline Fishery	3-87
	3.4.1.1.2.9	GOA Pacific Cod Jig Fishery	3-88
	3.4.1.1.2.10	GOA Pacific Cod Pot Fishery	3-88
3.4.1.1.3		Geographic Distribution and Intensity of Fishing Effort	3-89
	3.4.1.1.3.1	GOA Pollock Trawl Fishery	3-89
	3.4.1.1.3.2	GOA Pacific Cod Trawl Fishery	3-90
	3.4.1.1.3.3	GOA Deepwater Flatfish Trawl Fishery	3-90
	3.4.1.1.3.4	GOA Shallow Water Flatfish Trawl Fishery	3-90
	3.4.1.1.3.5	GOA Slope Rockfish Trawl Fishery	3-90
	3.4.1.1.3.6	GOA Sablefish Longline Fishery	3-91
	3.4.1.1.3.7	GOA Southeast Demersal Shelf Rockfish Longline Fishery	3-91
	3.4.1.1.3.8	GOA Pacific Cod Longline Fishery	3-91
	3.4.1.1.3.9	GOA Cod Jig Fishery	3-91
	3.4.1.1.3.10	GOA Pacific Cod Pot Fishery	3-91
3.4.1.1.4		Existing Socioeconomic Conditions	3-91
3.4.1.2		BSAI Groundfish Fisheries	3-93
	3.4.1.2.1	Summary of the BSAI Groundfish FMP	3-93
	3.4.1.2.2	Description of the Fisheries and Gears	3-97
	3.4.1.2.2.1	Bering Sea Pollock Trawl Fishery	3-97
	3.4.1.2.2.2	Aleutian Islands and Bogoslof Pollock Trawl Fishery	3-97
	3.4.1.2.2.3	BSAI Pacific Cod Trawl Fishery	3-98
	3.4.1.2.2.4	Bering Sea Rock Sole Trawl Fishery	3-99
	3.4.1.2.2.5	Bering Sea Yellowfin Sole Trawl Fishery	3-100
	3.4.1.2.2.6	Bering Sea Flathead Sole/Other Flatfish Trawl Fishery	3-101
	3.4.1.2.2.7	Aleutian Islands Pacific Ocean Perch and Northern Rockfish Trawl Fishery	3-102
	3.4.1.2.2.8	Aleutian Islands Atka Mackerel Trawl Fishery	3-103
	3.4.1.2.2.9	BSAI Pacific Cod Longline Fishery	3-103
	3.4.1.2.2.10	BSAI Sablefish/Greenland Halibut Longline Fishery	3-104
	3.4.1.2.2.11	Bering Sea Pacific Cod Jig Fishery	3-105
	3.4.1.2.2.12	BSAI Pacific Cod Pot Fishery	3-105
3.4.1.2.3		Geographic Distribution and Intensity of Fishing Effort	3-106
	3.4.1.2.3.1	Bering Sea Pollock Trawl Fishery	3-106
	3.4.1.2.3.2	Aleutian Islands and Bogoslof Pollock Trawl Fishery	3-106
	3.4.1.2.3.3	BSAI Pacific Cod Trawl Fishery	3-107
	3.4.1.2.3.4	Bering Sea Rock Sole Trawl Fishery	3-107
	3.4.1.2.3.5	Bering Sea Yellowfin Sole Trawl Fishery	3-107
	3.4.1.2.3.6	Bering Sea Flathead Sole/Other Flatfish Trawl Fishery	3-107
	3.4.1.2.3.7	BSAI Pacific Ocean Perch and Northern Rockfish Trawl Fishery	3-108
	3.4.1.2.3.8	Aleutian Islands Atka Mackerel Trawl	

	Fishery	3-108
	3.4.1.2.3.9 BSAI Pacific Cod Longline Fishery	3-108
	3.4.1.2.3.10 BSAI Sablefish/Greenland Halibut Longline Fishery	3-109
	3.4.1.2.3.11 Bering Sea Pacific Cod Jig Fishery	3-109
	3.4.1.2.3.12 BSAI Pacific Cod Pot Fishery	3-109
3.4.1.2.4	Existing Socioeconomic Conditions	3-109
3.4.1.3	BSAI King and Tanner Crab Fisheries	3-110
3.4.1.3.1	Summary of the BSAI Crab FMP	3-110
3.4.1.3.2	Description of the Fisheries and Gears	3-112
	3.4.1.3.2.1 Bristol Bay Red King Crab Fishery	3-112
	3.4.1.3.2.2 Norton Sound Red King Crab Fishery	3-113
	3.4.1.3.2.3 Pribilof Islands Red and Blue King Crab Fishery	3-114
	3.4.1.3.2.4 St. Matthew Blue King Crab Fishery	3-114
	3.4.1.3.2.5 Aleutian Islands Red King Crab Fishery	3-114
	3.4.1.3.2.6 Aleutian Islands Golden King Crab Fishery	3-114
	3.4.1.3.2.7 Aleutian Islands Tanner Crab Fishery	3-115
	3.4.1.3.2.8 Bering Sea Tanner Crab Fishery	3-115
	3.4.1.3.2.9 Bering Sea Snow Crab Fishery	3-116
3.4.1.3.3	Geographic Distribution and Intensity of Fishing Effort	3-116
	3.4.1.3.3.1 Bristol Bay Red King Crab Fishery	3-116
	3.4.1.3.3.2 Norton Sound Red King Crab Fishery	3-116
	3.4.1.3.3.3 Pribilof Islands Red and Blue King Crab Fishery	3-116
	3.4.1.3.3.4 St. Matthew Blue King Crab Fishery	3-116
	3.4.1.3.3.5 Aleutian Islands Red King Crab Fishery	3-117
	3.4.1.3.3.6 Aleutian Islands Golden King Crab Fishery	3-117
	3.4.1.3.3.7 Aleutian Islands Tanner Crab Fishery	3-117
	3.4.1.3.3.8 Bering Sea Tanner Crab Fishery	3-117
	3.4.1.3.3.9 Bering Sea Snow Crab Fishery	3-117
3.4.1.3.4	Existing Socioeconomic Conditions	3-117
3.4.1.4	Scallop Fisheries	3-121
	3.4.1.4.1 Summary of the Scallop FMP	3-121
	3.4.1.4.2 Description of the Fisheries and Gears	3-122
	3.4.1.4.3 Geographic Distribution and Intensity of Fishing Effort	3-123
	3.4.1.4.4 Existing Socioeconomic Conditions	3-123
3.4.1.5	Salmon Fisheries Off the Coast of Alaska	3-125
	3.4.1.5.1 Summary of the Salmon FMP	3-125
	3.4.1.5.2 Description of the Fisheries and Gears	3-126
	3.4.1.5.3 Geographic Distribution and Intensity of Fishing Effort	3-126
	3.4.1.5.4 Existing Socioeconomic Conditions	3-126
3.4.2	Fisheries Managed Under Other Authorities	3-127
3.4.2.1	Halibut Fisheries	3-127
	3.4.2.1.1 Summary of the Halibut Management Program	3-127
	3.4.2.1.2 Description of the Fisheries and Gears	3-127
	3.4.2.1.3 Geographic Distribution and Intensity of Fishing Effort	3-128
	3.4.2.1.4 Existing Socioeconomic Conditions	3-128
3.4.2.2	State-managed Groundfish Fisheries	3-129
	3.4.2.2.1 Summary of the Management Program	3-129
	3.4.2.2.1.1 State Pacific Cod Fishery	3-130
	3.4.2.2.1.2 State Pollock Fishery	3-132
	3.4.2.2.1.3 Sablefish	3-132

	3.4.2.2.1.4	Lingcod	3-133
	3.4.2.2.1.5	Rockfish	3-133
	3.4.2.2.2	Description of Fisheries and Gears	3-134
	3.4.2.2.3	Geographic Distribution and Intensity of Fishing Effort	3-134
	3.4.2.2.4	Existing Socioeconomic Conditions	3-134
3.4.2.3		State-managed Crab Fisheries	3-135
	3.4.2.3.1	Summary of the Management Program	3-135
	3.4.2.3.2	Description of the Fisheries and Gear	3-136
	3.4.2.3.2.1	Red King Crab	3-136
	3.4.2.3.2.2	Blue King Crab	3-137
	3.4.2.3.2.3	Golden King Crab	3-137
	3.4.2.3.2.4	Tanner Crab	3-137
	3.4.2.3.2.5	Snow Crab	3-138
	3.4.2.3.2.6	Korean Hair Crab	3-138
	3.4.2.3.2.7	Dungeness Crab	3-139
	3.4.2.3.2.8	Grooved Tanner Crab, Triangle Tanner Crab, and Scarlet King Crab	3-139
	3.4.2.3.3	Existing Socioeconomic Conditions	3-140
3.4.2.4		Herring Fisheries	3-140
	3.4.2.4.1	Summary of Management Program	3-140
	3.4.2.4.2	Description of Fisheries and Gears	3-140
	3.4.2.4.3	Geographic Distribution and Intensity of Fishing Effort	3-140
	3.4.2.4.4	Existing Socioeconomic Conditions	3-141
3.4.2.5		State-managed Salmon Fisheries	3-142
	3.4.2.5.1	Summary of the Management Program	3-142
	3.4.2.5.2	Description of the Fisheries and Gear	3-144
	3.4.2.5.2.1	Alaska Salmon Set Gill Net Fishery	3-144
	3.4.2.5.2.2	Alaska Salmon Draft Gillnet Fishery	3-144
	3.4.2.5.2.3	Alaska Salmon Seine Fishery	3-144
	3.4.2.5.2.4	Alaska Salmon Rod and Reel Fishery	3-145
	3.4.2.5.2.5	Alaska Salmon Fish Wheel Fishery (Commercial and Subsistence)	3-145
	3.4.2.5.2.6	Alaska Salmon Subsistence/Personal Use Fishery	3-146
	3.4.2.5.3	Geographic Distribution and Intensity of Effort	3-146
	3.4.2.5.4	Existing Socioeconomic Conditions	3-147
3.4.3		Effects of Fishing Activities on Fish Habitat	3-148
	3.4.3.1	Fishing Gear Used in Alaska Groundfish Fisheries	3-148
	3.4.3.1.1	Non-pelagic Otter Trawls	3-148
	3.4.3.1.2	Pelagic Trawls	3-149
	3.4.3.1.3	Scallop Dredges	3-150
	3.4.3.1.4	Longlines	3-151
	3.4.3.1.5	Pots	3-151
	3.4.3.2	Effects of Fishing Gear on Benthic Habitats	3-151
	3.4.3.2.1	Non-Pelagic Trawls	3-152
	3.4.3.2.1.1	Published Studies About Non-pelagic Trawl Effects	3-153
	3.4.3.2.1.2	Upcoming and Unpublished Studies	3-160
	3.4.3.2.1.3	Summary	3-161
	3.4.3.2.2	Pelagic Trawl Gear	3-161
	3.4.3.2.3	Scallop Dredges	3-162
	3.4.3.2.4	Longline Gear	3-166
	3.4.3.2.5	Pot Gear	3-166

3.4.4	Non-fishing Activities That May Affect Fish Habitat	3-168
3.5	Regulatory Environment	3-169
3.5.1	National Environmental Policy Act	3-169
3.5.2	Magnuson-Stevens Fishery Conservation and Management Act	3-169
3.5.3	Regulatory Flexibility Act	3-170
3.5.4	Executive Order 12866	3-171
3.5.5	Coordination with Others	3-171
3.5.6	Magnuson-Stevens Act Provisions and Regulations for EFH	3-172
<b>CHAPTER 4 ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES</b>		<b>4-1</b>
4.1	Effects of Describing and Identifying Essential Fish Habitat	4-1
4.1.1	Criteria for Evaluating the Effects of Describing and Identifying EFH	4-3
4.1.2	Effects of Alternative 1(No EFH Description and Identification)	4-3
4.1.2.1	Effects on Habitat	4-3
4.1.2.1.1	Prey Species	4-3
4.1.2.1.2	Benthic Biodiversity	4-4
4.1.2.1.3	Habitat Complexity	4-4
4.1.2.2	Effects on Target Species	4-4
4.1.2.2.1	Fishing Mortality	4-4
4.1.2.2.2	Spatial/Temporal Concentration of Catch	4-4
4.1.2.2.3	Productivity	4-4
4.1.2.2.4	Prey Availability	4-4
4.1.2.2.5	Growth to Maturity	4-5
4.1.2.3	Effects on Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-5
4.1.2.3.1	Passive Use	4-5
4.1.2.3.2	Gross Revenue	4-5
4.1.2.3.3	Operating Costs	4-5
4.1.2.3.4	Costs to Consumers	4-5
4.1.2.3.5	Safety	4-6
4.1.2.3.6	Socioeconomic Effects on Fishing Communities	4-6
4.1.2.3.7	Regulatory and Enforcement Programs	4-6
4.1.2.4	Effects on Other Fisheries and Fishery Resources	4-6
4.1.2.5	Effects on Protected Species	4-6
4.1.2.6	Effects on Ecosystems and Biodiversity	4-6
4.1.2.6.1	Predator-Prey Relationships	4-6
4.1.2.6.2	Energy Flow and Balance	4-7
4.1.2.6.3	Biodiversity	4-7
4.1.2.7	Effects on Non-fishing Activities	4-7
4.1.2.7.1	Costs to Federal and State Agencies	4-7
4.1.2.7.2	Costs to Non-fishing Industries or Other Proponents of Affected Activities	4-7
4.1.2.8	Summary of the Effects of Alternative 1	4-7
4.1.3	Effects of Alternative 2 (Status Quo EFH Description and Identification)	4-8
4.1.4	Effects of Alternative 3 (Revised General Distribution)	4-8
4.1.4.1	Effects on Habitat	4-9
4.1.4.1.1	Prey Species	4-9
4.1.4.1.2	Benthic Biodiversity	4-9
4.1.4.1.3	Habitat Complexity	4-9



4.1.4.2	Effects on Target Species	4-9
4.1.4.2.1	Fishing Mortality	4-9
4.1.4.2.2	Spatial/Temporal Concentration of Catch	4-9
4.1.4.2.3	Productivity	4-10
4.1.4.2.4	Prey Availability	4-10
4.1.4.2.5	Growth to Maturity	4-10
4.1.4.3	Effects on Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-10
4.1.4.3.1	Passive Use	4-10
4.1.4.3.2	Gross Revenue	4-10
4.1.4.3.3	Operating Costs	4-10
4.1.4.3.4	Costs to Consumers	4-11
4.1.4.3.5	Safety	4-11
4.1.4.3.6	Socioeconomic Effects on Fishing Communities	4-11
4.1.4.3.7	Regulatory and Enforcement Programs	4-11
4.1.4.4	Effects on Other Fisheries and Fishery Resources	4-11
4.1.4.5	Effects on Protected Species	4-11
4.1.4.6	Effects on Ecosystems and Biodiversity	4-12
4.1.4.6.1	Predator-Prey Relationships	4-12
4.1.4.6.2	Energy Flow and Balance	4-12
4.1.4.6.3	Biodiversity	4-12
4.1.4.7	Effects on Non-fishing Activities	4-12
4.1.4.7.1	Cost to Federal and State Agencies	4-12
4.1.4.7.2	Cost to Non-fishing Industries or Other Proponents of Affected Activities	4-12
4.1.4.8	Summary of the Effects of Alternative 3	4-13
4.1.5	Effects of Alternative 4 (Presumed Known Concentration)	4-13
4.1.5.1	Effects on Habitat	4-13
4.1.5.1.1	Prey Species	4-13
4.1.5.1.2	Benthic Biodiversity	4-14
4.1.5.1.3	Habitat Complexity	4-14
4.1.5.2	Effects on Target Species	4-14
4.1.5.2.1	Fishing Mortality	4-14
4.1.5.2.2	Spatial/Temporal Concentration of Catch	4-14
4.1.5.2.3	Productivity	4-14
4.1.5.2.4	Prey Availability	4-15
4.1.5.2.5	Growth to Maturity	4-15
4.1.5.3	Effects on Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-15
4.1.5.3.1	Passive Use	4-15
4.1.5.3.2	Gross Revenue	4-15
4.1.5.3.3	Operating Costs	4-15
4.1.5.3.4	Costs to Consumers	4-15
4.1.5.3.5	Safety	4-16
4.1.5.3.6	Socioeconomic Effects on Fishing Communities	4-16
4.1.5.3.7	Regulatory and Enforcement Programs	4-16
4.1.5.4	Effects on Other Fisheries and Fishery Resources	4-16
4.1.5.5	Effects on Protected Species	4-16
4.1.5.6	Effects on Ecosystems and Biodiversity	4-17
4.1.5.6.1	Predator-Prey Relationships	4-17
4.1.5.6.2	Energy Flow and Balance	4-17
4.1.5.6.3	Biodiversity	4-17

4.1.5.7	Effects on Non-fishing Activities	4-17
4.1.5.7.1	Costs to Federal and State Agencies	4-17
4.1.5.7.2	Costs to Non-fishing Industries or Other Proponents of Affected Activities	4-17
4.1.5.8	Summary of the Effects of Alternative 4	4-17
4.1.6	Effects of Alternative 5 (Eco-region Strategy)	4-18
4.1.6.1	Effects on Habitat	4-18
4.1.6.1.1	Prey Species	4-18
4.1.6.1.2	Benthic Biodiversity	4-18
4.1.6.1.3	Habitat Complexity	4-19
4.1.6.2	Effects on Target Species	4-19
4.1.6.2.1	Fishing Mortality	4-19
4.1.6.2.2	Spatial/Temporal Concentration of Catch	4-19
4.1.6.2.3	Productivity	4-19
4.1.6.2.4	Prey Availability	4-19
4.1.6.2.5	Growth to Maturity	4-19
4.1.6.3	Effects on Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-20
4.1.6.3.1	Passive Use	4-20
4.1.6.3.2	Gross Revenue	4-20
4.1.6.3.3	Operating Costs	4-20
4.1.6.3.4	Costs to Consumers	4-20
4.1.6.3.5	Safety	4-20
4.1.6.3.6	Socioeconomic Effects on Fishing Communities	4-20
4.1.6.3.7	Regulatory and Enforcement Programs	4-21
4.1.6.4	Effects on Other Fisheries and Fishery Resources	4-21
4.1.6.5	Effects on Protected Species	4-21
4.1.6.6	Effects on Ecosystems and Biodiversity	4-21
4.1.6.6.1	Predator-Prey Relationships	4-21
4.1.6.6.2	Energy Flow and Balance	4-21
4.1.6.6.3	Biodiversity	4-21
4.1.6.7	Effects on Non-fishing Activities	4-22
4.1.6.7.1	Costs to Federal and State Agencies	4-22
4.1.6.7.2	Costs to Non-fishing Industries or Other Proponents of Affected Activities	4-22
4.1.6.8	Summary of the Effects of Alternative 5	4-22
4.1.7	Effects of Alternative 6 (EEZ Only)	4-22
4.1.7.1	Effects on Habitat	4-23
4.1.7.1.1	Prey Species	4-23
4.1.7.1.2	Benthic Biodiversity	4-23
4.1.7.1.3	Habitat Complexity	4-23
4.1.7.2	Effects on Target Species	4-24
4.1.7.2.1	Fishing Mortality	4-24
4.1.7.2.2	Spatial/Temporal Concentration of Catch	4-24
4.1.7.2.3	Productivity	4-24
4.1.7.2.4	Prey Availability	4-24
4.1.7.2.5	Growth to Maturity	4-25
4.1.7.3	Effects on Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-25
4.1.7.3.1	Passive Use	4-25
4.1.7.3.2	Gross Revenue	4-25
4.1.7.3.3	Operating Costs	4-25
4.1.7.3.4	Costs to Consumers	4-25

4.1.7.3.5	Safety	4-25
4.1.7.3.6	Socioeconomic Effects on Fishing Communities	4-26
4.1.7.3.7	Regulatory and Enforcement Programs	4-26
4.1.7.4	Effects on Other Fisheries and Fishery Resources	4-26
4.1.7.5	Effects on Protected Species	4-26
4.1.7.6	Effects on Ecosystems and Biodiversity	4-26
4.1.7.6.1	Predator-Prey Relationships	4-26
4.1.7.6.2	Energy Flow and Balance	4-27
4.1.7.6.3	Biodiversity	4-27
4.1.7.7	Effects on Non-fishing Activities	4-27
4.1.7.7.1	Costs to Federal and State Agencies	4-27
4.1.7.7.2	Costs to Non-fishing Industries or Other Proponents of Affected Activities	4-27
4.1.7.8	Summary of the Effects of Alternative 6	4-28
4.2	Effects of Establishing an Approach for Identifying Habitat Areas of Particular Concern	4-29
4.2.1	Criteria for Evaluating the Effects of Establishing an Approach to Identify HAPCs	4-29
4.2.2	Effects of Alternative 1 (No HAPC Identification)	4-30
4.2.2.1	Effects on Habitat	4-30
4.2.2.2	Effects on Target Species	4-30
4.2.2.3	Effects on Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-30
4.2.2.4	Effects on Other Fisheries and Fishery Resources	4-30
4.2.2.5	Effects on Protected Species	4-31
4.2.2.6	Effects on Ecosystems and Biodiversity	4-31
4.2.2.7	Effects on Non-fishing Activities	4-31
4.2.2.8	Summary of the Effects of Alternative 1	4-31
4.2.3	Effects of Alternative 2 (Status Quo HAPCs)	4-31
4.2.4	Effects of Alternative 3 (Site Based Concept)	4-32
4.2.4.1	Effects on Habitat	4-32
4.2.4.2	Effects on Target Species	4-32
4.2.4.3	Effects on Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-32
4.2.4.4	Effects on Other Fisheries and Fishery Resources	4-33
4.2.4.5	Effects on Protected Species	4-33
4.2.4.6	Effects on Ecosystems and Biodiversity	4-33
4.2.4.7	Effects on Non-fishing Activities	4-33
4.2.4.8	Summary of the Effects of Alternative 3	4-33
4.2.5	Effects of Alternative 4 (Type/Site Based Concept)	4-33
4.2.5.1	Effects on Habitat	4-33
4.2.5.2	Effects on Target Species	4-34
4.2.5.3	Effects on Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-34
4.2.5.4	Effects on Other Fisheries and Fishery Resources	4-34
4.2.5.5	Effects on Protected Species	4-34
4.2.5.6	Effects on Ecosystems and Biodiversity	4-34
4.2.5.7	Effects on Non-fishing Activities	4-34
4.2.5.8	Summary of the Effects of Alternative 4	4-35
4.2.6	Effects of Alternative 5 (Species Core Area)	4-35
4.2.6.1	Effects on Habitat	4-35
4.2.6.2	Effects on Target Species	4-35

4.2.6.3	Effects on Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-35
4.2.6.4	Effects on Other Fisheries and Fishery Resources	4-36
4.2.6.5	Effects on Protected Species	4-36
4.2.6.6	Effects on Ecosystems and Biodiversity	4-36
4.2.6.7	Effects on Non-fishing Activities	4-36
4.2.6.8	Summary of the Effects of Alternative 5	4-36
4.3	Effects of Minimizing the Adverse Effects of Fishing on EFH	4-37
4.3.1	Criteria for Evaluating the Effects of Minimizing the Adverse Effects of Fishing on EFH	4-37
4.3.1.1	Habitat	4-37
4.3.1.2	Target Species	4-40
4.3.1.2.1	Groundfish	4-40
4.3.1.2.2	FMP Salmon, Crabs, and Scallops	4-41
4.3.1.2.2.1	Salmon	4-41
4.3.1.2.2.2	Crabs	4-42
4.3.1.2.2.3	Scallops	4-43
4.3.1.3	Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-44
4.3.1.4	Other Fisheries and Fishery Resources	4-50
4.3.1.4.1	State-managed Groundfish Fisheries	4-50
4.3.1.4.2	State-managed Crab and Invertebrate Fisheries	4-50
4.3.1.4.3	Herring Fisheries	4-51
4.3.1.4.4	Halibut Fisheries	4-51
4.3.1.5	Protected Species	4-51
4.3.1.6	Ecosystems	4-52
4.3.2	Effects of Alternative 1	4-54
4.3.2.1	Effects of Alternative 1 on Habitat	4-54
4.3.2.2	Effects of Alternative 1 on Target Species	4-55
4.3.2.2.1	Effects on Groundfish	4-55
4.3.2.2.1.1	Walleye Pollock (EBS and GOA)	4-55
4.3.2.2.1.2	Pacific Cod (EBS and GOA)	4-57
4.3.2.2.1.3	Sablefish (EBS and GOA)	4-57
4.3.2.2.1.4	Atka Mackerel (EBS and GOA)	4-59
4.3.2.2.1.5	Yellowfin Sole (EBS)	4-60
4.3.2.2.1.6	Greenland Turbot (EBS)	4-61
4.3.2.2.1.7	Arrowtooth Flounder (EBS and GOA)	4-61
4.3.2.2.1.8	Rock Sole (EBS)	4-62
4.3.2.2.1.9	Flathead Sole (EBS and GOA)	4-63
4.3.2.2.1.10	Rex Sole (GOA)	4-63
4.3.2.2.1.11	Alaska Plaice (EBS)	4-64
4.3.2.2.1.12	Shallow Water Flatfish (GOA)	4-65
4.3.2.2.1.13	Deep Water Flatfish (GOA)	4-65
4.3.2.2.1.14	Pacific Ocean Perch (EBS)	4-66
4.3.2.2.1.15	Pacific Ocean Perch (GOA)	4-67
4.3.2.2.1.16	Shortraker and Rougheye Rockfish (EBS)	4-69
4.3.2.2.1.17	Shortraker and Rougheye Rockfish (GOA)	4-70
4.3.2.2.1.18	Northern Rockfish (EBS)	4-71
4.3.2.2.1.19	Northern Rockfish (GOA)	4-72
4.3.2.2.1.20	Pelagic Shelf Rockfish (GOA)	4-73
4.3.2.2.1.21	Other Rockfish Species (EBS)	4-75
4.3.2.2.1.22	Shortspine Thornyheads (EBS)	4-76
4.3.2.2.1.23	Forage Species (EBS and GOA)	4-76

4.3.2.2.2	Effects on FMP Salmon, Crabs, and Scallops	4-77
4.3.2.2.2.1	Salmon	4-77
4.3.2.2.2.2	Crabs	4-78
4.3.2.2.2.3	Scallops	4-79
4.3.2.3	Effects of Alternative 1 on Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-79
4.3.2.3.1	Effects on the Fishing Fleet	4-79
4.3.2.3.2	Effects on Communities and Shoreside Industries	4-80
4.3.2.3.3	Effects on Regulatory and Enforcement Programs	4-80
4.3.2.4	Effects of Alternative 1 on Other Fisheries and Fishery Resources	4-80
4.3.2.5	Effects of Alternative 1 on Protected Species	4-81
4.3.2.6	Effects of Alternative 1 on the Ecosystem	4-82
4.3.3	Effects of Alternative 2	4-83
4.3.3.1	Effects of Alternative 2 on Habitat	4-83
4.3.3.2	Effects of Alternative 2 on Target Species	4-84
4.3.3.2.1	Effects on Groundfish	4-84
4.3.3.2.1.1	Walleye Pollock (EBS and GOA)	4-84
4.3.3.2.1.2	Pacific Cod (EBS and GOA)	4-85
4.3.3.2.1.3	Sablefish (EBS and GOA)	4-86
4.3.3.2.1.4	Atka Mackerel (EBS and GOA)	4-87
4.3.3.2.1.5	Yellowfin Sole (EBS)	4-88
4.3.3.2.1.6	Greenland Turbot (EBS)	4-88
4.3.3.2.1.7	Arrowtooth Flounder (EBS and GOA)	4-88
4.3.3.2.1.8	Rock Sole (EBS)	4-89
4.3.3.2.1.9	Flathead Sole (EBS and GOA)	4-89
4.3.3.2.1.10	Rex Sole (GOA)	4-90
4.3.3.2.1.11	Alaska Plaice (EBS)	4-91
4.3.3.2.1.12	Shallow Water Flatfish (GOA)	4-91
4.3.3.2.1.13	Deep Water Flatfish (GOA)	4-92
4.3.3.2.1.14	Pacific Ocean Perch (EBS)	4-92
4.3.3.2.1.15	Pacific Ocean Perch (GOA)	4-92
4.3.3.2.1.16	Shortraker and Rougheye Rockfish (EBS)	4-93
4.3.3.2.1.17	Shortraker and Rougheye Rockfish (GOA)	4-93
4.3.3.2.1.18	Northern Rockfish (EBS)	4-94
4.3.3.2.1.19	Northern Rockfish (GOA)	4-94
4.3.3.2.1.20	Pelagic Shelf Rockfish (GOA)	4-95
4.3.3.2.1.21	Other Rockfish Species (EBS)	4-96
4.3.3.2.1.22	Shortspine Thornyheads (EBS)	4-96
4.3.3.2.1.23	Forage Species (EBS and GOA)	4-96
4.3.3.2.2	Effects on FMP Salmon, Crabs, and Scallops	4-97
4.3.3.2.2.1	Salmon	4-97
4.3.3.2.2.2	Crabs	4-97
4.3.3.2.2.3	Scallops	4-98
4.3.3.3	Effects of Alternative 2 on Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-98
4.3.3.3.1	Effects on the Fishing Fleet	4-98
4.3.3.3.2	Effects on Communities and Shoreside Industries	4-100
4.3.3.3.3	Effects on Regulatory and Enforcement Programs	4-102
4.3.3.4	Effects of Alternative 2 on Other Fisheries and Fishery Resources	4-104
4.3.3.5	Effects of Alternative 2 on Protected Species	4-105
4.3.3.6	Effects of Alternative 2 on Ecosystems	4-106
4.3.4	Effects of Alternative 3	4-107
4.3.4.1	Effects of Alternative 3 on Habitat	4-107

4.3.4.2	Effects of Alternative 3 on Target Species	4-107
4.3.4.2.1	Effects on Groundfish	4-107
4.3.4.2.1.1	Walleye Pollock (EBS and GOA)	4-107
4.3.4.2.1.2	Pacific Cod (EBS and GOA)	4-109
4.3.4.2.1.3	Sablefish (EBS and GOA)	4-110
4.3.4.2.1.4	Atka Mackerel (EBS and GOA)	4-111
4.3.4.2.1.5	Yellowfin Sole (EBS)	4-112
4.3.4.2.1.6	Greenland Turbot (EBS)	4-112
4.3.4.2.1.7	Arrowtooth Flounder (EBS and GOA)	4-112
4.3.4.2.1.8	Rock Sole (EBS)	4-113
4.3.4.2.1.9	Flathead Sole (EBS and GOA)	4-113
4.3.4.2.1.10	Rex Sole (GOA)	4-114
4.3.4.2.1.11	Alaska Plaice (EBS)	4-114
4.3.4.2.1.12	Shallow Water Flatfish (GOA)	4-114
4.3.4.2.1.13	Deep Water Flatfish (GOA)	4-115
4.3.4.2.1.14	Pacific Ocean Perch (EBS)	4-116
4.3.4.2.1.15	Pacific Ocean Perch (GOA)	4-116
4.3.4.2.1.16	Shortraker and Rougheye Rockfish (EBS)	4-117
4.3.4.2.1.17	Shortraker and Rougheye Rockfish (GOA)	4-117
4.3.4.2.1.18	Northern Rockfish (EBS)	4-118
4.3.4.2.1.19	Northern Rockfish (GOA)	4-118
4.3.4.2.1.20	Pelagic Shelf Rockfish (GOA)	4-119
4.3.4.2.1.21	Other Rockfish Species (EBS)	4-120
4.3.4.2.1.22	Shortspine Thornyheads (EBS)	4-121
4.3.4.2.1.23	Forage Species (EBS and GOA)	4-121
4.3.4.2.2	Effects on FMP Salmon, Crabs, and Scallops	4-121
4.3.4.2.2.1	Salmon	4-121
4.3.4.2.2.2	Crabs	4-122
4.3.4.2.2.3	Scallops	4-122
4.3.4.3	Effects of Alternative 3 on Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-122
4.3.4.3.1	Effects on the Fishing Fleet	4-122
4.3.4.3.2	Effects on Communities and Shoreside Industries	4-125
4.3.4.3.3	Effects on Regulatory and Enforcement Programs	4-128
4.3.4.4	Effects of Alternative 3 on Other Fisheries and Fishery Resources	4-130
4.3.4.5	Effects of Alternative 3 on Protected Species	4-130
4.3.4.6	Effects of Alternative 3 on Ecosystem	4-132
4.3.5	Effects of Alternative 4	4-132
4.3.5.1	Effects of Alternative 4 on Habitat	4-132
4.3.5.2	Effects of Alternative 4 on Target Species	4-134
4.3.5.2.1	Effects on Groundfish	4-134
4.3.5.2.1.1	Walleye Pollock (EBS and GOA)	4-134
4.3.5.2.1.2	Pacific Cod (EBS and GOA)	4-134
4.3.5.2.1.3	Sablefish (EBS and GOA)	4-136
4.3.5.2.1.4	Atka Mackerel (EBS and GOA)	4-136
4.3.5.2.1.5	Yellowfin Sole (EBS)	4-137
4.3.5.2.1.6	Greenland Turbot (EBS)	4-138
4.3.5.2.1.7	Arrowtooth Flounder (EBS and GOA)	4-138
4.3.5.2.1.8	Rock Sole (EBS)	4-139
4.3.5.2.1.9	Flathead Sole (EBS and GOA)	4-140
4.3.5.2.1.10	Rex Sole (GOA)	4-141
4.3.5.2.1.11	Alaska Plaice (EBS)	4-141
4.3.5.2.1.12	Shallow Water Flatfish (GOA)	4-142

4.3.5.2.1.13	Deep Water Flatfish (GOA)	4-143
4.3.5.2.1.14	Pacific Ocean Perch (EBS)	4-144
4.3.5.2.1.15	Pacific Ocean Perch (GOA)	4-144
4.3.5.2.1.16	Shortraker and Rougheye Rockfish (EBS)	4-144
4.3.5.2.1.17	Shortraker and Rougheye Rockfish (GOA)	4-145
4.3.5.2.1.18	Northern Rockfish (EBS)	4-145
4.3.5.2.1.19	Northern Rockfish (GOA)	4-146
4.3.5.2.1.20	Pelagic Shelf Rockfish (GOA)	4-146
4.3.5.2.1.21	Other Rockfish Species (EBS)	4-146
4.3.5.2.1.22	Shortspine Thornyheads (EBS)	4-146
4.3.5.2.1.23	Forage Species (EBS and GOA)	4-147
4.3.5.2.2	Effects on FMP Salmon, Crabs, and Scallops	4-148
4.3.5.2.2.1	Salmon	4-148
4.3.5.2.2.2	Crabs	4-148
4.3.5.2.2.3	Scallops	4-149
4.3.5.3	Effects of Alternative 4 on Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-149
4.3.5.3.1	Effects on the Fishing Fleet	4-149
4.3.5.3.2	Effects on Communities and Shoreside Industries	4-153
4.3.5.3.3	Effects on Regulatory and Enforcement Programs	4-155
4.3.5.4	Effects of Alternative 4 on Other Fisheries and Fishery Resources	4-158
4.3.5.5	Effects of Alternative 4 on Protected Species	4-159
4.3.5.6	Effects of Alternative 4 on Ecosystems	4-160
4.3.6	Effects of Alternative 5A	4-161
4.3.6.1	Effects of Alternative 5A on Habitat	4-161
4.3.6.2	Effects of Alternative 5A on Target Species	4-162
4.3.6.2.1	Effects on Groundfish	4-162
4.3.6.2.1.1	Walleye Pollock (BSAI and GOA)	4-162
4.3.6.2.1.2	Pacific Cod (BSAI and GOA)	4-164
4.3.6.2.1.3	Sablefish (BSAI and GOA)	4-165
4.3.6.2.1.4	Atka Mackerel (BSAI and GOA)	4-167
4.3.6.2.1.5	Yellowfin Sole (BSAI)	4-168
4.3.6.2.1.6	Greenland Turbot (BSAI)	4-169
4.3.6.2.1.7	Arrowtooth Flounder (BSAI and GOA)	4-169
4.3.6.2.1.8	Rock Sole (BSAI)	4-170
4.3.6.2.1.9	Flathead Sole (BSAI and GOA)	4-171
4.3.6.2.1.10	Rex Sole (GOA)	4-172
4.3.6.2.1.11	Alaska Plaice (BSAI)	4-172
4.3.6.2.1.12	Shallow Water Flatfish (GOA)	4-173
4.3.6.2.1.13	Deep Water Flatfish (GOA)	4-174
4.3.6.2.1.14	Pacific Ocean Perch (BSAI)	4-174
4.3.6.2.1.15	Pacific Ocean Perch (GOA)	4-175
4.3.6.2.1.16	Shortraker and Rougheye Rockfish (BSAI)	4-177
4.3.6.2.1.17	Shortraker and Rougheye Rockfish (GOA)	4-177
4.3.6.2.1.18	Northern Rockfish (BSAI)	4-178
4.3.6.2.1.19	Northern Rockfish (GOA)	4-179
4.3.6.2.1.20	Pelagic Shelf Rockfish (GOA)	4-180
4.3.6.2.1.21	Other Rockfish Species (BSAI)	4-182
4.3.6.2.1.22	Shortspine Thornyheads (BSAI)	4-182
4.3.6.2.1.23	Forage Species (BSAI and GOA)	4-183
4.3.6.2.2	Effects on FMP Salmon, Crabs, and Scallops	4-183
4.3.6.2.2.1	Salmon	4-183
4.3.6.2.2.2	Crabs	4-184

4.3.6.2.2.3	Scallops	4-184
4.3.6.3	Effects of Alternative 5A on Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-185
4.3.6.3.1	Effects on the Fishing Fleet	4-185
4.3.6.3.2	Effects on Communities and Shoreside Industries	4-190
4.3.6.3.3	Effects on Regulatory and Enforcement Programs	4-194
4.3.6.4	Effects of Alternative 5A on Other Fisheries and Fishery Resources	4-196
4.3.6.5	Effects of Alternative 5A on Protected Species	4-196
4.3.6.6	Effects of Alternative 5A on Ecosystems	4-198
4.3.7	Effects of Alternative 5B	4-199
4.3.7.1	Effects of Alternative 5B on Habitat	4-199
4.3.7.2	Effects of Alternative 5B on Target Species	4-200
4.3.7.2.1	Effects on Groundfish	4-200
4.3.7.2.1.1	Walleye Pollock (BSAI and GOA)	4-200
4.3.7.2.1.2	Pacific Cod (BSAI and GOA)	4-201
4.3.7.2.1.3	Sablefish (BSAI and GOA)	4-204
4.3.7.2.1.4	Atka Mackerel (BSAI and GOA)	4-204
4.3.7.2.1.5	Yellowfin Sole (BSAI)	4-205
4.3.7.2.1.6	Greenland Turbot (BSAI)	4-206
4.3.7.2.1.7	Arrowtooth Flounder (BSAI and GOA)	4-207
4.3.7.2.1.8	Rock Sole (BSAI)	4-208
4.3.7.2.1.9	Flathead Sole (BSAI and GOA)	4-208
4.3.7.2.1.10	Rex Sole (GOA)	4-209
4.3.7.2.1.11	Alaska Plaice (BSAI)	4-210
4.3.7.2.1.12	Shallow Water Flatfish (GOA)	4-211
4.3.7.2.1.13	Deep Water Flatfish (GOA)	4-211
4.3.7.2.1.14	Pacific Ocean Perch (BSAI)	4-212
4.3.7.2.1.15	Pacific Ocean Perch (GOA)	4-213
4.3.7.2.1.16	Shortraker and Rougheye Rockfish (BSAI)	4-214
4.3.7.2.1.17	Shortraker and Rougheye Rockfish (GOA)	4-215
4.3.7.2.1.18	Northern Rockfish (BSAI)	4-216
4.3.7.2.1.19	Northern Rockfish (GOA)	4-216
4.3.7.2.1.20	Pelagic Shelf Rockfish (GOA)	4-218
4.3.7.2.1.21	Other Rockfish Species (BSAI)	4-219
4.3.7.2.1.22	Shortspine Thornyheads (BSAI)	4-220
4.3.7.2.1.23	Forage Species (BSAI and GOA)	4-220
4.3.7.2.2	Effects on FMP Salmon, Crabs, and Scallops	4-221
4.3.7.2.2.1	Salmon	4-221
4.3.7.2.2.2	Crabs	4-221
4.3.7.2.2.3	Scallops	4-222
4.3.7.3	Effects of Alternative 5B Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-222
4.3.7.3.1	Effects on the Fishing Fleet	4-223
4.3.7.3.2	Effects on Communities and Shoreside Industries	4-228
4.3.7.3.3	Effects on Regulatory and Enforcement Programs	4-231
4.3.7.4	Effects of Alternative 5B on Other Fisheries and Fishery Resources	4-233
4.3.7.5	Effects of Alternative 5B on Protected Species	4-234
4.3.7.6	Effects of Alternative 5B on Ecosystems	4-235
4.3.8	Effects of Alternative 6	4-236
4.3.8.1	Effects of Alternative 6 on Habitat	4-236
4.3.8.2	Effects of Alternative 6 on Target Species	4-237
4.3.8.2.1	Effects on Groundfish	4-237
4.3.8.2.1.1	Walleye Pollock (BSAI and GOA)	4-237



4.3.8.2.1.2	Pacific Cod (BSAI and GOA)	4-238
4.3.8.2.1.3	Sablefish (BSAI and GOA)	4-239
4.3.8.2.1.4	Atka Mackerel (BSAI and GOA)	4-240
4.3.8.2.1.5	Yellowfin Sole (BSAI)	4-242
4.3.8.2.1.6	Greenland Turbot (BSAI)	4-242
4.3.8.2.1.7	Arrowtooth Flounder (BSAI and GOA)	4-243
4.3.8.2.1.8	Rock Sole (BSAI)	4-244
4.3.8.2.1.9	Flathead Sole (BSAI and GOA)	4-245
4.3.8.2.1.10	Rex Sole (GOA)	4-246
4.3.8.2.1.11	Alaska Plaice (BSAI)	4-246
4.3.8.2.1.12	Shallow Water Flatfish (GOA)	4-247
4.3.8.2.1.13	Deep Water Flatfish (GOA)	4-248
4.3.8.2.1.14	Pacific Ocean Perch (BSAI)	4-248
4.3.8.2.1.15	Pacific Ocean Perch (GOA)	4-249
4.3.8.2.1.16	Shortraker and Rougheye Rockfish (BSAI)	4-250
4.3.8.2.1.17	Shortraker and Rougheye Rockfish (GOA)	4-251
4.3.8.2.1.18	Northern Rockfish (BSAI)	4-252
4.3.8.2.1.19	Northern Rockfish (GOA)	4-252
4.3.8.2.1.20	Pelagic Shelf Rockfish (GOA)	4-253
4.3.8.2.1.21	Other Rockfish Species (BSAI)	4-254
4.3.8.2.1.22	Shortspine Thornyheads (BSAI)	4-255
4.3.8.2.1.23	Forage Species (BSAI and GOA)	4-256
4.3.8.2.2	Effects on FMP Salmon, Crabs, and Scallops	4-256
4.3.8.2.2.1	Salmon	4-256
4.3.8.2.2.2	Crabs	4-257
4.3.8.2.2.3	Scallops	4-258
4.3.8.3	Effects of Alternative 6 Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-258
4.3.8.3.1	Effects on the Fishing Fleet	4-258
4.3.8.3.2	Effects on Communities and Shoreside Industries	4-262
4.3.8.3.3	Effects on Regulatory and Enforcement Programs	4-275
4.3.8.4	Effects of Alternative 6 on Other Fisheries and Fishery Resources	4-276
4.3.8.5	Effects of Alternative 6 on Protected Species	4-277
4.3.8.6	Effects of Alternative 6 on Ecosystems	4-278
4.4	Cumulative Effects	4-281
4.4.1	Methods and Criteria for Evaluating Cumulative Effects	4-281
4.4.2	Previous Actions and Other External Factors Potentially Contributing to Cumulative Effects	4-282
4.4.2.1	Previous Actions Potentially Contributing to Cumulative Effects	4-282
4.4.2.2	External Factors	4-283
4.4.3	Reasonably Foreseeable Future NMFS and Council Actions	4-286
4.4.3.1	Research and Monitoring Approaches for Evaluation of EFH Fishing Impact Minimization Alternatives	4-286
4.4.3.2	Future NMFS and Council Management Actions	4-286
4.4.3.3	Review and Revision of EFH Components of FMPs	4-289
4.4.4	Cumulative Effects on Habitat	4-290
4.4.4.1	Prey Species	4-290
4.4.4.2	Benthic Biodiversity	4-292
4.4.4.3	Habitat Complexity	4-295
4.4.5	Cumulative Effects on Target Species	4-297
4.4.5.1	Cumulative Effects on Target Groundfish Stocks	4-297
4.4.5.1.1	Fishing Mortality and Stock Biomass	4-297
4.4.5.1.2	Spatial/Temporal Concentration of Catch	4-299

4.4.5.1.3	Productivity (Spawning/Breeding)	4-302
4.4.5.1.4	Feeding	4-304
4.4.5.1.5	Growth to Maturity	4-306
4.4.5.2	Cumulative Effects on Salmon Stocks, Crab, and Scallops	4-309
4.4.5.2.1	Fishing Mortality and Stock Biomass	4-309
4.4.5.2.2	Spatial/Temporal Concentration of Catch	4-311
4.4.5.2.3	Productivity (Spawning/Breeding)	4-313
4.4.5.2.4	Prey Availability (Feeding)	4-317
4.4.5.2.5	Growth to Maturity	4-320
4.4.6	Cumulative Effects on Economics and Socioeconomic Aspects of Federally Managed Fisheries	4-323
4.4.6.1	Passive Use Value and Future Use Benefits	4-323
4.4.6.2	Gross Revenue Effects	4-324
4.4.6.3	Operating Costs	4-328
4.4.6.4	Costs to United States Consumers	4-330
4.4.6.5	Safety	4-332
4.4.6.6	Socioeconomic Effects on Existing Communities	4-334
4.4.6.7	Effects on Regulatory and Enforcement Programs	4-339
4.4.7	Cumulative Effects on Other Fisheries and Fishery Resources	4-341
4.4.7.1	State-managed Groundfish Fisheries	4-341
4.4.7.2	State-managed Crab and Invertebrate Species	4-342
4.4.7.3	Herring Fisheries	4-344
4.4.7.4	Halibut Fisheries	4-346
4.4.8	Cumulative Effects on Protected Species	4-347
4.4.8.1	ESA-listed Marine Mammals	4-347
4.4.8.2	Other Marine Mammals	4-350
4.4.8.3	ESA-listed Pacific Salmon and Steelhead	4-352
4.4.8.4	ESA-listed Seabirds	4-354
4.4.8.5	Other Seabirds	4-356
4.4.9	Cumulative Effects on Ecosystems and Biodiversity	4-358
4.4.9.1	Predator-Prey Relationships	4-358
4.4.9.2	Energy Flow and Balance	4-359
4.4.9.3	Diversity	4-361
4.4.10	Cumulative Effects on Non-fishing Activities	4-363
4.4.10.1	Costs to Federal and State Agencies	4-363
4.4.10.2	Costs to Non-fishing Industries and Other Proponents of Affected Activities	4-365
4.4.11	Cumulative Socioeconomic Effects	4-367
4.4.12	Summary of Cumulative Effects	4-368
4.5	Summary and Conclusions	4-373
4.5.1	Comparison of Effects of the Alternatives for Describing and Identifying EFH	4-373
4.5.1.1	Comparative Summary of Effects	4-373
4.5.1.1.1	Effects on Habitat	4-373
4.5.1.1.2	Effects on Target Species	4-374
4.5.1.1.3	Effects of Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-375
4.5.1.1.4	Effects on Other Fisheries and Fishery Resources	4-376
4.5.1.1.5	Effects on Protected Species	4-377
4.5.1.1.6	Effects on Ecosystems and Biodiversity	4-378
4.5.1.1.7	Effects on Non-fishing Activities	4-378
4.5.1.2	Adverse Effects that Cannot be Avoided When Describing and Identifying EFH	4-379
4.5.1.3	Conclusions	4-380

4.5.2	Comparison of Effects of the Alternative Approaches for Identifying HAPCs	4-381
4.5.2.1	Comparative Summary of Effects	4-381
4.5.2.1.1	Effects on Habitat	4-381
4.5.2.1.2	Effects on Target Species	4-382
4.5.2.1.3	Effects of Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-383
4.5.2.1.4	Effects on Other Fisheries and Fishery Resources	4-384
4.5.2.1.5	Effects on Protected Species	4-384
4.5.2.1.6	Effects on Ecosystems and Biodiversity	4-385
4.5.2.1.7	Effects on Non-fishing Activities	4-386
4.5.2.2	Adverse Effects that Cannot be Avoided When Establishing a HAPC Approach	4-386
4.5.2.3	Conclusions	4-387
4.5.3	Comparison of the Alternative for Minimizing Fishing Effects on EFH	4-387
4.5.3.1	Comparative Summary of Effects	4-388
4.5.3.1.1	Effects on Habitat	4-388
4.5.3.1.2	Effects on Target Species	4-390
4.5.3.1.3	Effects on Economic and Socioeconomic Aspects of Federally Managed Fisheries	4-391
4.5.3.1.4	Effects on Other Fisheries and Fishery Resources	4-393
4.5.3.1.5	Effects on Protected Species	4-394
4.5.3.1.6	Effects on Ecosystems	4-395
4.5.3.2	Summary of Cumulative Effects by Criterion for Alternatives to Minimize the Adverse Effects of Fishing on EFH	4-396
4.5.3.3	Practicability Analysis for the Alternatives to Minimize the Effects of Fishing on EFH	4-397
4.5.3.4	Adverse Effects that Cannot be Avoided When Minimizing Effects of Fishing on EFH	4-400
4.5.3.5	Conclusions	4-400
4.5.4	Relationship of Findings to the Revised Draft Programmatic Groundfish SEIS	4-400
<b>CHAPTER 5 LIST OF PREPARERS AND CONTRIBUTORS</b>		<b>5-1</b>
5.1	North Pacific Fishery Management Council (Council)	5-1
5.2	National Oceanic and Atmospheric Administration (NOAA) and NMFS/National Marine Fisheries Service (NMFS)	5-1
5.3	Contributors from Other Agencies	5-11
5.4	Consultant Contributors	5-11
5.5	North Pacific Fishery Management Council Essential Fish Habitat Committee	5-12
<b>CHAPTER 6 AGENCIES, ORGANIZATIONS, AND PERSONS RECEIVING COPIES OF THE EIS</b>		<b>6-1</b>
6.1	North Pacific Fishery Management Council (Council)	6-1
6.1.1	Council Members and Alternates	6-1
6.1.2	Advisory Panel Members	6-2
6.1.3	Science and Statistical Committee Members	6-3
6.1.4	Other Persons on the Council's Standard Distribution List	6-4
6.1.5	EFH Committee Members (those members not in above lists)	6-5
6.1.6	Council Staff	6-5
6.2	Interested Publics	6-6
6.3	Federal and State Agencies and Commissions	6-13
6.3.1	Department of Agriculture	6-13
6.3.2	Department of Defense	6-13
6.3.3	Department of Homeland Security	6-13

6.3.4	Department of Housing and Urban Development	6-14
6.3.5	Department of Interior	6-14
6.3.6	Department of Transportation	6-15
6.3.7	U.S. Environmental Protection Agency	6-15
6.3.8	Federal Energy Regulatory Commission (FERC)	6-15
6.3.9	State of Alaska	6-15
6.3.10	Commissions and Other Councils	6-16
6.4	Libraries	6-16
6.5	Media	6-18
6.6	Authors/Contributors/Reviewers and Internal NMFS Distribution	6-18
6.6.1	NMFS General	6-18
6.6.2	NMFS NEPA Coordinators (Not previously listed)	6-20
6.7	Contractor Contributors	6-20
<b>CHAPTER 7 INDEX OF TOPICS</b>		<b>7-1</b>
<b>CHAPTER 8 LITERATURE CITED</b>		<b>8-1</b>
<b>CHAPTER 9 TABLES AND FIGURES</b>		<b>9-1</b>
APPENDIX A	ESSENTIAL FISH HABITAT FINAL SCOPING REPORT	
APPENDIX B	EVALUATION OF FISHING ACTIVITIES THAT MAY ADVERSELY AFFECT ESSENTIAL FISH HABITAT	
APPENDIX C	REGULATORY IMPACT REVIEW / INITIAL REGULATORY FLEXIBILITY ANALYSIS	
APPENDIX D	EFH TEXT AND MAP DESCRIPTIONS FOR FEDERALLY MANAGED SPECIES OF THE ALASKA REGION	
APPENDIX E	NMFS RECOMMENDATIONS FOR THE EFH PROVISIONS OF THE FMPS	
APPENDIX F	HABITAT ASSESSMENT REPORT	
APPENDIX G	NON-FISHING IMPACTS TO ESSENTIAL FISH HABITAT AND RECOMMENDED CONSERVATION	
APPENDIX H	EFH EIS DATA ANALYSIS METHODS	
APPENDIX I	CONSISTENCY WITH APPLICABLE LAWS AND OTHER REQUIREMENTS	
APPENDIX J	PROPOSED HAPC IDENTIFICATION PROCESS	
APPENDIX K	RESEARCH AND MONITORING APPROACHES FOR EVALUATION OF EFH FISHING IMPACT MINIMIZATION ALTERNATIVES	

# FIGURES

## Executive Summary Figures

Figure ES-1	Areas Closed Year-round to Bottom Trawling
Figure ES-2	Alternative 2: Gulf Slope Bottom Trawl Closures
Figure ES-3	Alternative 3: Upper Slope Bottom Trawl Closures
Figure ES-4	Alternative 4: Bering Sea Open/Closed Areas
Figure ES-5	Alternative 4: Aleutian Islands Closure Areas
Figure ES-6	Alternative 4: GOA Closure Areas
Figure ES-7	Alternatives 5A and 5B: Bering Sea Open/Closed Areas
Figure ES-8	Alternative 5A: Aleutian Islands Closed Areas
Figure ES-9	Alternative 5A and 5B: GOA Closure Areas
Figure ES-10	Alternative 5B: Aleutian Islands Open/Closed Areas
Figure ES-11	Alternative 6: Closure Areas (Gulf of Alaska)
Figure ES-12	Alternative 6: Closure Areas (Aleutian Islands)
Figure ES-13	Alternative 6: Closure Areas (Bering Sea)

## Chapter 2 Figures

Figure 2-1	Areas Closed Year-round to Bottom Trawling
Figure 2-2	State of Alaska's Catalog of Waters Regions
Figure 2-3	Alternative 2: Essential Fish Habitat for GOA Late Juvenile and Adult Pacific Ocean Perch
Figure 2-4	Alternative 2: Essential Fish Habitat for Late Juvenile and Adult Pacific Cod
Figure 2-5	Alternative 2: Essential Fish Habitat for Golden King Crab Eggs
Figure 2-6	Alternative 2: Essential Fish Habitat for Mature and Late Juvenile Golden King Crab
Figure 2-7	Alternative 2: Essential Fish Habitat for GOA Adult and Late Juvenile Weathervane Scallops
Figure 2-8	Alternative 2: Essential Fish Habitat for BSAI Adult and Late Juvenile Weathervane Scallops
Figure 2-9	Alternative 2: Essential Fish Habitat for Freshwater Salmon in Alaska
Figure 2-10	Alternative 3: Essential Fish Habitat for GOA Late Juvenile and Adult Pacific Ocean Perch
Figure 2-11	Alternative 3: Essential Fish Habitat for BSAI Late Juvenile and Adult Pacific Cod
Figure 2-12	Alternative 3: Essential Fish Habitat for BSAI Golden King Crab
Figure 2-13	Alternative 3: Essential Fish Habitat for Weathervane Scallops
Figure 2-14	Alternative 3: Essential Fish Habitat for Freshwater Chinook Salmon
Figure 2-15	Alternative 3: Essential Fish Habitat for Marine Chinook Salmon

Figure 2-16	Alternative 4: Essential Fish Habitat for GOA Pacific Ocean Perch
Figure 2-17	Alternative 4: Essential Fish Habitat for Late Juvenile and Adult Pacific Cod
Figure 2-18	Alternative 4: Essential Fish Habitat for BSAI Golden King Crab
Figure 2-19	Alternative 4: Essential Fish Habitat for Weathervane Scallops
Figure 2-20	Alternative 4: Essential Fish Habitat for Freshwater Chinook Salmon Eggs and Adults
Figure 2-21	Alternative 4: Essential Fish Habitat for Freshwater Chinook Salmon Larvae and Juveniles
Figure 2-22	Alternative 4: Essential Fish Habitat for Marine Chinook Salmon
Figure 2-23	Alternative 5: Nearshore and Estuarine Essential Fish Habitat
Figure 2-24	Alternative 5: Essential Fish Habitat of the GOA Inner and Middle Shelf Ecoregion (0 to 100 m)
Figure 2-25	Alternative 5: Essential Fish Habitat of the BSAI Inner and Middle Shelf Ecoregion (0 to 100 m)
Figure 2-26	Alternative 5: Essential Fish Habitat of the GOA Outer Shelf Ecoregion (100 to 200 m)
Figure 2-27	Alternative 5: Essential Fish Habitat of the BSAI Outer Shelf Ecoregion (100 to 200 m)
Figure 2-28	Alternative 5: Essential Fish Habitat of the GOA Upper Slope Ecoregion (200 to 500 m)
Figure 2-29	Alternative 5: Essential Fish Habitat of the BSAI Upper Slope Ecoregion (200 to 500 m)
Figure 2-30	Alternative 5: Essential Fish Habitat of the GOA Middle Slope Ecoregion (500 to 1,000 m)
Figure 2-31	Alternative 5: Essential Fish Habitat of the BSAI Middle Slope Ecoregion (500 to 1,000 m)
Figure 2-32	Alternative 5: Essential Fish Habitat of the GOA Lower Slope Ecoregion (1,000 to 3,000 m)
Figure 2-33	Alternative 5: Essential Fish Habitat of the BSAI Middle Slope Ecoregion (500 to 1,000 m)
Figure 2-34	Alternative 5: Essential Fish Habitat of the GOA Basin Ecoregion (>3,000 m)
Figure 2-35	Alternative 5: Essential Fish Habitat of the BSAI Basin Ecoregion (>3,000 m)
Figure 2-36	Alternative 6: Essential Fish Habitat for Late Juvenile and Adult GOA Pacific Ocean Perch
Figure 2-37	Alternative 6: Essential Fish Habitat for Late Juvenile and Adult BSAI Pacific Cod
Figure 2-38	Alternative 6: Essential Fish Habitat for BSAI Golden King Crab
Figure 2-39	Alternative 6: Essential Fish Habitat for Late Juvenile and Adult Weathervane Scallops
Figure 2-40	Alternative 6: Essential Fish Habitat for Marine Juvenile and Maturing Adult Chinook Salmon
Figure 2-41	Alternative 2: Gulf Slope Bottom Trawl Closures
Figure 2-42	Alternative 3: Upper Slope Bottom Trawl Closures
Figure 2-43	Alternative 4: Bering Sea Open/Closed Areas
Figure 2-44	Diagram of Trawl Gear
Figure 2-45	Alternative 4: Aleutian Islands Closure Areas

Figure 2-46	Alternative 4: GOA Closure Areas
Figure 2-47	Alternatives 5A and 5B: GOA Closure Areas
Figure 2-48	Alternative 5A: Aleutian Islands Closed Areas
Figure 2-49	Alternative 5A and 5B: Bering Sea Open/Closed Areas
Figure 2-50	Alternative 5B: Aleutian Islands Open/Closed Areas
Figure 2-51	Alternative 6: Closure Areas (Gulf of Alaska)
Figure 2-52	Alternative 6: Closure Areas (Aleutian Islands)
Figure 2-53	Alternative 6: Closure Areas (Bering Sea))

### Chapter 3 Figures

Figure 3.1-1	Surficial sediment textural characteristics according to Naidu (1988) for the portion of the continental shelf which is the focus of the EBSSSED database. The number-code of each polygon indicates Folk's (1954) sorting level from key.
Figure 3.1-2	Distribution of Bering Sea Sediments
Figure 3.2-1	GOA Walleye Pollock – Estimated Biomass
Figure 3.2-2	GOA Pacific Cod – Estimated Biomass
Figure 3.2-3	GOA Arrowtooth Flounder – Estimated Biomass
Figure 3.2-4	GOA Flathead Sole – Estimated Biomass
Figure 3.2-5	GOA Rex Sole – Estimated Biomass
Figure 3.2-6	GOA Deep Water Flatfish – Estimated Biomass
Figure 3.2-7	GOA Shallow Water Flatfish – Estimated Biomass
Figure 3.2-8	GOA Sablefish – Estimated Biomass
Figure 3.2-9	GOA Pacific Ocean Perch – Estimated Biomass
Figure 3.2-10	GOA Shortraker/Rougheye Rockfish – Estimated Biomass
Figure 3.2-11	GOA Northern Rockfish – Estimated Biomass
Figure 3.2-12	GOA Pelagic Shelf Rockfish – Estimated Biomass
Figure 3.2-13	GOA Demersal Shelf Rockfish – Estimated Biomass
Figure 3.2-14	GOA Thornyhead Rockfish – Estimated Biomass
Figure 3.2-15	BSAI Walleye Pollock – Estimated Biomass
Figure 3.2-16	BSAI Pacific Cod – Estimated Biomass
Figure 3.2-17	BSAI Yellowfin Sole – Estimated Biomass
Figure 3.2-18	BSAI Greenland Turbot – Estimated Biomass
Figure 3.2-19	BSAI Arrowtooth Flounder
Figure 3.2-20	BSAI Rock Sole – Estimated Biomass
Figure 3.2-21	BSAI Flathead Sole – Estimated Biomass
Figure 3.2-22	BSAI Sablefish – Estimated Biomass
Figure 3.2-23	BSAI Pacific Ocean Perch – Estimated Biomass

Figure 3.2-24	BSAI Atka Mackerel – Estimated Biomass
Figure 3.2-25	Weathervane Scallops Alaska Landings
Figure 3.2-26	Observed Locations of Recent Halibut Bycatch on Longlines, with Cod Longliner Target Fishery
Figure 3.2-27	Observed Locations of Recent Halibut Bycatch in Bottom Trawls, with Target Fishery Distributions
Figure 3.2-28	Historical Red King Crab Catch (in 1,000 mt) in Cook Inlet, Kodiak, Aleutian Islands, and Bristol Bay. Cook Inlet, Kodiak, and Aleutian Islands catches are given per season (for example, 1960 refers to the 1960/61 season).
Figure 3.2-29	Historical Blue King Crab Catch (in 1,000 mt) in the Pribilof Islands and St. Matthew Island. The Pribilof Islands catches are given per season (for example, 1972 refers to the 1972/73 season).
Figure 3.2-30	Historical Seasonal Golden King Crab Catch (in 1,000 mt) in PWS and the Aleutian Islands. Catches are given per season (for example, 1981 refers to the 1981/82 season).
Figure 3.2-31	Historical Tanner Crab Catch (in 1,000 mt) in the PWS, Cook Inlet, Kodiak, Chignik, Southern Peninsula, and Bering Sea Areas. Some catches are given per season (spanning two calendar years), whereas others are per calendar year.
Figure 3.2-32	Historical Snow Crab Catch (in 1,000 mt) in the Bering Sea. Some catches are given per season (spanning two calendar years), whereas others are per calendar year.
Figure 3.2-33	Historical Korean Hair Crab Catch (in 1,000 mt) in the Bering Sea. Some catches are given per season (spanning two calendar years), whereas others are per calendar year.
Figure 3.2-34	Historical Annual Dungeness Crab Catch (in 1,000 mt) in the PWS, Cook Inlet, Kodiak, and Alaska Peninsula Districts.
Figure 3.2-35	Management Areas Involving Prohibited Species and Walrus in the Bering Sea
Figure 3.2-36	Historical Trend of Pacific Herring Catch in the Bering Sea and the Gulf of Alaska, 1990-1998.
Figure 3.2-37	Final Critical Habitat for Spectacled and Steller's Eider
Figure 3.2-38	Distribution of Horny Corals
Figure 3.2-39	Distribution of Sponges
Figure 3.2-40	Distribution of Bryozoans
Figure 3.2-41	Distribution of Hydroids
Figure 3.2-42	Distribution of Sea Raspberries
Figure 3.2-43	Distribution of Sea Pen
Figure 3.2-44	Distribution of Anemones
Figure 3.2-45	Distribution of Sea Onion
Figure 3.2-46	Distribution of Sea Peach
Figure 3.3-1	Biomass Trends in Bering Sea Trophic Guilds, 1979 to 1998
Figure 3.3-2	Trophic Interactions of Key Eastern Bering Sea Groundfish
Figure 3.3-3	Trophic Relationships of the Groundfishes in the Aleutian Islands
Figure 3.3-4	Trophic Relationships of the Groundfishes in the Gulf of Alaska



Figure 3.3-5	Trend in Index of Species Composition Based on Ordination of Species Abundance Data from Five Triennial Surveys on Gulf of Alaska Shelf and Slope with Approximate 95 Percent Confidence Interval
Figure 3.4-1	Pelagic Trawl
Figure 3.4-2	Bottom Trawl
Figure 3.4-3	Set Longline Gear
Figure 3.4-4	Vertical Longline
Figure 3.4-5	Jig Machine
Figure 3.4-6	Gulf of Alaska: 1990-2002 Observed Pollock Pelagic Trawl Effort (Sets/25 km <sup>2</sup> )
Figure 3.4-7	Gulf of Alaska: 1990-2002 Observed Pollock Non-Pelagic (Bottom) Trawl Effort (Sets/25 km <sup>2</sup> )
Figure 3.4-8	Gulf of Alaska: 1990-2002 Observed Pacific Cod Non-Pelagic (Bottom) Trawl Effort (Sets/25 km <sup>2</sup> )
Figure 3.4-9	Gulf of Alaska: 1990-2002 Observed Deepwater Flatfish Non-Pelagic Trawl Effort (Sets/25 km <sup>2</sup> )
Figure 3.4-10	Gulf of Alaska: 1990-2002 Observed Shallow Water Flatfish Non-Pelagic Trawl Effort (Sets/25 km <sup>2</sup> )
Figure 3.4-11	Gulf of Alaska: 1990-2002 Observed Slope Rockfish Pelagic Trawl Effort (Sets/25 km <sup>2</sup> )
Figure 3.4-12	Gulf of Alaska: 1990-2002 Observed Rockfish Non-Pelagic (Bottom) Trawl Effort (Sets/25 km <sup>2</sup> )
Figure 3.4-13	Gulf of Alaska: 1990-2002 Observed Sablefish and Turbot Hook and Line Effort (Sets/25 km <sup>2</sup> )
Figure 3.4-14	Gulf of Alaska: 1990-2002 Observed Pacific Cod Hook and Line Effort (Sets/25 km <sup>2</sup> )
Figure 3.4-15	Gulf of Alaska: 1990-2002 Observed Pacific Cod Pot Effort (Sets/25 km <sup>2</sup> )
Figure 3.4-16	Bering Sea: 1990-2002 Observed Pollock Pelagic Trawl Effort (Sets/25 km <sup>2</sup> )
Figure 3.4-17	Bering Sea: 1990-2002 Observed Pollock Non-Pelagic (Bottom) Trawl Effort (Sets/25 km <sup>2</sup> )
Figure 3.4-18	Aleutian Islands: 1990-2002 Observed Pollock Pelagic Trawl Effort (Sets/25 km <sup>2</sup> )
Figure 3.4-19	Aleutian Islands: 1990-2002 Observed Pollock Non-Pelagic (Bottom) Trawl Effort (Sets/25 km <sup>2</sup> )
Figure 3.4-20	Bering Sea: 1990-2002 Observed Pacific Cod Non-Pelagic (Bottom) Trawl Effort (Sets/25 km <sup>2</sup> )
Figure 3.4-21	Aleutian Islands: 1990-2002 Observed Pacific Cod Non-Pelagic (Bottom) Trawl Effort (Sets/25 km <sup>2</sup> )
Figure 3.4-22	Bering Sea: 1990-2002 Observed Rock Sole Non-Pelagic (Bottom) Trawl Effort (Sets/25 km <sup>2</sup> )
Figure 3.4-23	Bering Sea: 1990-2002 Observed Yellowfin Sole Non-Pelagic (Bottom) Trawl Effort (Sets/25 km <sup>2</sup> )
Figure 3.4-24	Bering Sea: 1990-2002 Observed Flathead Sole and Other Flatfish Non-Pelagic (Bottom) Trawl Effort (Sets/25 km <sup>2</sup> )

- Figure 3.4-25 Bering Sea: 1990-2002 Observed Rockfish Non-Pelagic (Bottom) Trawl Effort (Sets/25 km<sup>2</sup>)
- Figure 3.4-26 Aleutian Islands: 1990-2002 Observed Rockfish Non-Pelagic (Bottom) Trawl Effort (Sets/25 km<sup>2</sup>)
- Figure 3.4-27 Aleutian Islands: 1990-2002 Observed Atka Mackerel Non-Pelagic (Bottom) Trawl Effort (Sets/25 km<sup>2</sup>)
- Figure 3.4-28 Bering Sea: 1990-2002 Observed Pacific Cod Hook and Line Effort (Sets/25 km<sup>2</sup>)
- Figure 3.4-29 Aleutian Islands: 1990-2002 Observed Pacific Cod Hook and Line Effort (Sets/25 km<sup>2</sup>)
- Figure 3.4-30 Bering Sea: 1990-2002 Observed Sablefish and Turbot Hook and Line Trawl Effort (Sets/25 km<sup>2</sup>)
- Figure 3.4-31 Aleutian Islands: 1990-2002 Observed Sablefish and Turbot Hook and Line Effort (Sets/25 km<sup>2</sup>)
- Figure 3.4-32 Bering Sea: 1990-2002 Observed Pacific Cod Pot Effort (Sets/25 km<sup>2</sup>)
- Figure 3.4-33 Aleutian Islands: 1990-2002 Observed Pacific Cod Pot Effort (Sets/25 km<sup>2</sup>)
- Figure 3.4-34 Crab Pot/Pacific Cod Pot
- Figure 3.4-35 Scallop Dredge, The New Bedford Style
- Figure 3.4-36 Salmon Troll
- Figure 3.4-37 Year-round Non-pelagic Trawl Closure Areas (shaded areas) in State Waters of the Central and Western Gulf of Alaska and Southeastern Bering Sea
- Figure 3.4-38 Year-round and Seasonal Trawl Restrictions in Prince William Sound
- Figure 3.4-39 State Groundfish Regions
- Figure 3.4-40 Alaskan Herring Fisheries
- Figure 3.4-41 Herring Sac Roe Harvests, 1963-2001
- Figure 3.4-42 Drift Gillnet
- Figure 3.4-43 Purse Seine Gear

#### **Chapter 4 Figures**

- Figure 4.3-1 Blue king crab female abundance from trawl survey data and blue king crab catch data, by State of Alaska statistical area.
- Figure 4.3-2 Red king crab female abundance from trawl survey data and red king crab catch data, by State of Alaska statistical area.
- Figure 4.3-3 Snow crab female abundance from trawl survey data and snow crab catch data, by State of Alaska statistical area.
- Figure 4.3-4 Tanner crab female abundance from trawl survey data and Tanner crab catch data, by State of Alaska statistical area.
- Figure 4.3-6 Locations of commercial scallop beds in Alaska.

# TABLES

## Executive Summary Tables

Table ES-1.	Environmental Consequences Summary
Table ES-2	Comparative Summary of Effects of EFH Description Alternatives
Table ES-3	Comparison of EFH Description Alternatives
Table ES-4	Comparative Summary of Effects for HAPC Identification Alternatives
Table ES-5	Comparison of Alternative Approaches for Identifying HAPCs
Table ES-6	Comparative Summary of Alternatives to Minimize the Adverse Effects of Fishing on EFH
Table ES-7	Summary Comparison of Environmental Effects of the Alternatives to Minimize the Adverse Effects of Fishing on EFH
Table ES-8	Synopsis of Habitat Benefits and Economic Costs of Alternatives to Minimize the Adverse Effects of Fishing on EFH
Table ES-9	Total Area Closed on a Year-round Basis, by Gear Type and Depth, for the Alternatives and Pre-Status Quo Baseline

## Chapter 2 Tables

Table 2-1	Habitat Protection Provided by Current Closure Areas under the Status Quo
Table 2-2	Chronology of Major Events Relative to the Development of this EIS for EFH since the Passage of the Sustainable Fisheries Act (SFA) in 1996
Table 2-3	Habitat Associations of Example Species
Table 2-4	Reproductive Traits of Example Species
Table 2-5	Food Habits of Example Species
Table 2-6	Comparison of Alternatives to Identify HAPC, with Examples of Sites/Types/Areas that Could be Identified as HAPC in a Subsequent Process
Table 2-7	Crosswalk of Objectives and Management Measures Contained in the Alternatives to Minimize the Effects of Fishing on EFH

## Chapter 3 Tables

Table 3.2-1	Halibut Bycatch Mortality (mt) in the GOA, 1995-2001
Table 3.2-2	Halibut Bycatch in BSAI Trawl Fisheries for 2000 and First Half of 2001
Table 3.2-3	Seasonal Halibut Bycatch in BSAI Fixed Gear Fisheries in 2000 and First Half of 2001
Table 3.2-4	Bycatch of Red King Crab in Zone 1 BSAI Fisheries
Table 3.2-5	Herring Bycatch in the BSAI Area in 2000 and 2001
Table 3.2-6	Endangered and Threatened Species under the ESA that May be Present in the BSAI
Table 3.2-7	Summary of Salmonid Species Listed and Proposed for Listing under the Endangered Species Act

Table 3.2-8	Coded Wire Tag Recoveries of Listed Salmon Species Surrogate Stocks from 1984 through 1999 in the GOA and BSAI Groundfish Fisheries
Table 3.2-9	The Diet of Selected Eastern Bering Sea Shelf Groundfish Species
Table 3.2-10	The Diet of Selected Eastern Bering Sea Slope Groundfish Species
Table 3.2-11	Percent by Weight of Important Prey Consumed by Groundfish in the Gulf of Alaska
Table 3.2-12	Percent by Weight of Important Prey Consumed by Groundfish in the Aleutian Islands
Table 3.4-1	Groundfish Socioeconomic Regions and their Acronyms
Table 3.4-2	Selected North Pacific Groundfish Participation Measures by Region, 2001
Table 3.4-3	Groundfish Harvests Delivered to Inshore Plants by Species Group, 2001
Table 3.4-4	Groundfish Wholesale Value (\$Millions) of Regionally Owned Processors by Processor Class, 2001
Table 3.4-5	Groundfish Retained Harvest by Catcher Vessels Owned by Residents of Various Regions by FMP Subarea, 2001
Table 3.4-6	Number of Boats and Retained Catch by Weight and Value by Species Group by Catcher Vessel Ownership by Region, 2001
Table 3.4-7	Retained Harvests by FMP Area and Species of Regional Catcher Vessels, 2001
Table 3.4-8	Community Rankings by Alaska Groundfish Catcher Vessels Owned by Residents of the Alaska Peninsula and Aleutian Islands Region, 1992-2000
Table 3.4-9	Community Rankings by Alaska Groundfish Catcher Vessels Owned by Residents of the Kodiak Island Region, 1992-2000
Table 3.4-10	Community Rankings by Alaska Groundfish Catcher Vessels Owned by Residents of the Alaska Southcentral Region, 1992-2000
Table 3.4-11	Community Rankings by Alaska Groundfish Catcher Vessels Owned by Residents of the Southeast Alaska Region, 1992-2000
Table 3.4-12	Average Annual Number of Vessels Participating (qualified landings) in Relevant BSAI Crab Fisheries 1991-2000 by Community (with a minimum average of two vessels)
Table 3.4-13	Average Number of Relevant BSAI Species Crab Vessels in Various Fisheries Categories, by Fisheries Category and Community of Vessel Owner – Alaska, Washington, and Oregon, 1991-2000
Table 3.4-14	Average Annual Value of Harvest for Relevant BSAI Species Crab Vessels in Various Fisheries Categories, by Fisheries Category and Community Vessel Owner – Alaska, Washington, and Oregon, 1991-2000
Table 3.4-15	Annual Average Number of Qualified Catcher Processors by Relevant BSAI Crab Fishery and Location of Owner of Vessel, 1991-2000
Table 3.4-16	Average Annual Number of Processors in Relevant BSAI Crab Fisheries 1991-2000 by Community (with a minimum average of 0.5 processors)
Table 3.4-17	Annual Average Number of Processors, 1991-2000, by City/Port Category and BSAI Crab Fishery
Table 3.4-18	Annual Average of Value in Dollars of Crab Processed, 1991-2000, by City/Port Category and BSAI Crab Fishery
Table 3.4-19	Vessels, Landings, and Price in the Alaska Weathervane Scallop Fishery, 1980-1995

Table 3.4-20	Scallop Vessels, Home Ports, Areas Fished 1996-1998, Number of Years Fished 1980-1998, and LLP Qualification Status
Table 3.4-21	2002 IFQ Halibut Allocations and Landings
Table 3.4-22	Top Ten Alaska Halibut Port Landings for 2002 and Port Rankings, 1995-2002
Table 3.4-23	Changes in Halibut Quota Share (QS) Holdings between Initial Issuance and Currently Issued (as of December 31,2002)
Table 3.4-24	Quota Held by “IFQ Crewmembers” by Species, Area, and Residence Category at Year-End 2002
Table 3.4-25	Vessels Participating in IFQ Halibut Fishery; All Vessels Landing Halibut, by Area, 1992-2002 Seasons
Table 3.4-26	State and Federal Managed Groundfish Harvest in the GOA in 2000
Table 3.4-27	2001 State-managed Fisheries Commercial Groundfish Harvest
Table 3.4-28	Dungeness Crab Harvest in Alaska
Table 3.4-29	Korean Hair Crab Harvests
Table 3.4-30	Status of Alaska Herring Fisheries in 1999
Table 3.4-31	Alaska Sac Roe Herring Catch 2000-2002
Table 3.4-32	Bering Sea Herring Sac Roe Harvest 1980-1998
Table 3.4-33	Commercial Salmon Harvest, 1970-1989
Table 3.4-34	Commercial Salmon Harvest, 1990-2002
Table 3.4-35	Comparison of Gear, Fishing Intensity, and Habitat Features for Studies of the Effects of Bottom Trawl on Benthic Habitat
Table 3.4-36	Summary of Non-fishing Threats to Essential Fish Habitat in Alaska
Table 3.4-37	Summary of Effects Determination of Non-fishing Threats to Essential Fish Habitat in Alaska
Table 3.9-2	Total Catcher-Vessel and Catcher-Processor Revenue at Risk by Alternative and Fleet Component

#### **Chapter 4 Tables**

Table 4.1-1	Criteria for Describing the Effects on Habitat of Identifying EFH and HAPCs
Table 4.1-2	Criteria for Describing the Effects on Target Species of Identifying EFH and HAPCs
Table 4.1-3	Criteria for Describing the Effects on Economic and Socioeconomic Aspects of Federally Managed Fisheries of Identifying EFH and HAPCs
Table 4.1-4	Criteria for Describing the Effects on Other Fisheries and Fishery Resources of Identifying EFH and HAPCs
Table 4.1-5	Criteria for Describing the Effects on Protected Resources of Identifying EFH and HAPCs
Table 4.1-6	Criteria for Describing the Effects on Ecosystems and Biodiversity of Identifying EFH and HAPCs
Table 4.1-7	Criteria for Describing the Effects on Non-fishing Activities of Identifying EFH and HAPCs

Table 4.3-1	Long-term Effect Indices (LEIs) for Effects of Fishing on Benthic Essential Fish Habitat Features of Alaska, by Alternative
Table 4.3-2	Percent of Area Closed to all Nonpelagic Trawling by Habitat for Principal Coral Habitats
Table 4.3-3	Criteria for Describing the Effects on Essential Fish Habitat of Minimizing the Effects of Fishing
Table 4.3-4	Criteria for Describing the Effects on FMP Groundfish of Minimizing the Effects of Fishing
Table 4.3-5	Criteria for Describing the Effects on FMP Salmon, Crabs, and Scallops of Minimizing the Effects of Fishing
Table 4.3-6	Criteria for Describing the Effects on the Economic and Socioeconomic Aspects of Federally Managed Fisheries of Minimizing the Effects of Fishing
Table 4.3-7	Criteria for Describing the Effects on Other Fisheries and Fishery Resources of Minimizing the Effects of Fishing
Table 4.3-8	Criteria for Describing the Effects on Protected Species of Minimizing the Effects of Fishing
Table 4.3-9	Criteria for Describing the Effects on Ecosystem Processes of Minimizing the Effects of Fishing
Table 4.4-1	Environmental Consequences Summary
Table 4.4-2	Recent Trends for Populations of Target Species in the GOA and BSAI
Table 4.5-1	Comparative Summary of Effects of EFH Description Alternatives
Table 4.5-2	Comparison of EFH Description Alternatives
Table 4.5-3	Comparative Summary of Effects for HAPC Identification Alternatives
Table 4.5-4	Comparison of Alternative Approaches for Identifying HAPCs
Table 4.5-5	Comparative Summary of Effects for Alternatives to Minimize the Effects of Fishing on EFH
Table 4.5-6	Summary Comparison of Environmental Effects of the Alternatives to Minimize the Adverse Effects of Fishing on EFH
Table 4.5-7	Synopsis of Habitat Benefits and Economic Costs of Alternatives to Minimize the Adverse Effects of Fishing on EFH
Table 4.5-8	Total Area Closed on a Year-round Basis, by Gear Type and Depth, for the Alternatives and Pre-Status Quo Baseline
Table 4.5-9	Major Differences between the Alaska Groundfish Fisheries PSEIS and the EFH EIS
Table 4.5-10	Differences in Data and Methods for Habitat Effect Analysis and Evaluation Issues

## ACRONYMS AND ABBREVIATIONS

ABC	acceptable biological catch
ABOF	Alaska Board of Fisheries
ADF&G	Alaska Department of Fish and Game
AEB	AI East Borough
AFA	American Fisheries Act
AFSC	NMFS Alaska Fisheries Science Center
AI	Aleutian Islands
Alaska Stream	Alaska Coastal Current
AP	Council's Advisory Panel
APA	Administrative Procedures Act
BB	Bristol Bay
BOF	Board of Fisheries
BS	Bering Sea
BSAI	Bering Sea and Aleutian Islands
CDQ	community development quota
CEQ	Council on Environmental Quality
CFEC	Commercial Fisheries Entry Commission
CFR	Code of Federal Regulations
CG	Central GOA
cm	centimeter
CH	critical habitat (as defined under ESA)
CMSA	consolidated metropolitan statistical area
Council	North Pacific Fishery Management Council
Councils	Fishery Management Councils
CPUE	catch per unit effort
CV	coefficient of variation
CVOA	catcher vessel operational area
CWT	coded wire tag
CZMA	Coastal Zone Management Act
DAH	domestic annual harvest
DAP	domestic annual processing
DCPL	daily cumulative production logbook
DEIS	Draft EIS
DFL	daily fishing logbook
DPGSEIS	Draft Programmatic Groundfish SEIS
DRG	scallop dredge
DSR	demersal shelf rockfish
DSR	demersal shelf rockfish
E.O.	Executive Order
EA	environmental assessment
EAI	Eastern Aleutian Islands
EBS	Eastern Bering Sea
EEZ	exclusive economic zone
EFH	essential fish habitat
EG	Eastern GOA
EIS	environmental impact statement
ENSO	El Niño/Southern Oscillation
EOs	executive orders
ESA	Endangered Species Act

ESU	evolutionarily significant unit
FMP	fishery management plan
FMU	fishery management unit
FO	frequency of occurrence
FONSI	finding of no significant impact
FR	Federal Register
FWCA	Fish and Wildlife Coordination Act
GHL	guideline harvest level
GHRs	guidelines harvest ranges
GIS	geographic information system
GKC	Golden King Crab
GOA	Gulf of Alaska
GPS	global positioning system
GRS	groundfish retention standard
ha	hectare
HAPC	habitat area of particular concern
HCP	National Habitat Conservation Policy
HLA	harvest limit area
ICA	incidental catch allowance
IFQ	individual fishing quota
IFR	interim final rule
INPFC	International North Pacific Fisheries Commission
IPHC	International Pacific Halibut Commission
IR/IU	improved retention and improved utilization
IRFA	initial regulatory flexibility analysis
ITAC	interim total allowable catch
ITQ	individual transferable quota
JIG	dinglebar troll
km	kilometer
LEI	long-term effect indices
LLP	License Limitation Program
LOA	length overall
m	meter
<i>M</i>	natural mortality rate
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MMPA	Marine Mammal Protection Act
MPA	marine protected area
MRA	maximum retainable amount
MRB	maximum retainable bycatch
MRR	Marine Research Reserve
MRV	Marine Reserve
MSST	minimum stock size threshold
MSY	maximum sustainable yield
mt	metric ton
NAO	NOAA Administrative Order
NEPA	National Environmental Policy Act
nm	nautical mile
NMFS	National Marine Fisheries Service
NMML	National Marine Mammal Laboratory
NOA	notice of availability
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NORPAC	catch



NPFMC (Council)	North Pacific Fishery Management Council
NPT	nonpelagic trawl
NRC	National Research Council
OFL	overfishing level
OFL	overfishing level
OMB	Office of Management and Budget
OY	optimum yield
OY	optimum yield
PBR	potential biological removal
PDO	Pacific decadal oscillation
PR	proposed rule
PSC	prohibited species catch
PSC	Pacific Salmon Commission
PSQ	prohibited species quota
PTR	pelagic trawl gear
Pub. L.	Public Law
RACE	fishery geographic information data resources
RAM	restricted access management
REFM	NMFS AFSC Resource Ecology and Fisheries Management Division
RFA	Regulatory Flexibility Act
RIR	regulatory impact review
RKCSA	Red King Crab Savings Area
ROD	record of decision
RPA	reasonable and prudent alternatives
SAFE	Stock assessment and fishery evaluation
SBREFA	Small Business Regulatory Enforcement Fairness Act
SCA	Steller sea lion conservation area
SCUBA	self-contained underwater breathing apparatus
Secretary	Secretary of Commerce
SEIS	supplemental environmental impact statement
SPR	spawning per recruit
SSC	Council's Scientific and Statistical Committee
TAC	total allowable catch
U.S.C.	United States Code
USCG	United States Coast Guard
USDOC	United States Department of Commerce
USDOI	United States Department of the Interior
USFWS	United States Fish and Wildlife Service
VIP	Vessel Incentive Program
VMP	Vessel Moratorium Program
VMS	vessel monitoring system
WAI	Western Aleutian Islands
WG	Western GOA
WHSa	Winter herring savings area
WPR	weekly production report
WYK	West Yakutat Area